

SANITARYWARE, URINALS, FLUSH FREE URINAL, BATHS TECHNICAL CRITERIA

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1 SCOPE

This document defines the test procedures and requirements for the evaluation of flush volumes and bath volumes for sanitaryware, urinals and bathtubs for the listing on the Unified Water Label. Unified Water Label has been developed to work alongside National Countries Building Regulations and other National nuances.

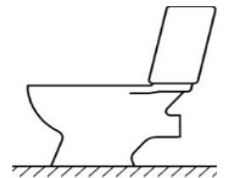
2 DEFINITIONS

2.1 Water Closet or WC

Water Closet or WC is a term that is generally applied to facilities intended for the removal of human waste. It is a colloquial term that is often used as blanket terminology for any part or component of the toilet suite. There are subdivisions of products; WC bowls, flushing cisterns and tested combinations of bowls and cisterns known as suites.

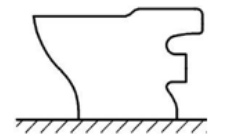
2.2 WC Suites

A sanitary appliance that consists of a WC bowl/flushing cistern combination with associated fittings that has been tested and complies with Type 1 (clause 5) or Type 2 (clause 6) of EN 997



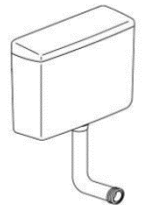
2.3 Independent WC Bowls

A sanitary appliance that is an independent WC bowl, designed to work with specified volume(s) of water and intended to be coupled with a suitable independent flushing cistern (compliant with EN 14055) that have been tested and complies with Type 1 or Type 2 (independent) WC bowls of EN 997.



2.4 Independent WC Flushing Cisterns

A sanitary appliance that is a WC flushing cistern (sometimes referred to as a tank), delivering specified volume(s) of water, complete with flushing mechanism, inlet valve and flush-pipe and intended to be coupled with a suitable independent WC bowl (compliant with EN 997) that have been tested and complies with Type 1 or Type 2 flushing cisterns of EN 14055.



2.5 Replacement WC Flush Mechanisms

A replacement flushing mechanism that has been tested and complies with the relevant parts of Type 1 clause 5 or Type 2 Clause 6 of EN 997.

2.6 Urinals

Urinals are sanitary appliance comprising a bowl for receiving urine and a flushing device, e.g. a flushing cistern, delivering water used for flushing and directing both, urine and water, into a drainage system.

2.7 Urinal (bowls)

A sanitary appliance comprising a bowl for receiving urine and water used for flushing and directing both into a drainage system

2.8 Independent Urinal Flushing Cisterns

A urinal flushing cistern (sometimes referred to as a tank), delivering specified volume(s) of water, complete with flushing mechanism and inlet valve that have been tested and complies with Type 3 of EN 14055 i.e. flush volumes less than 5 litres per flush

2.9 Urinal Controllers

A urinal controller device, in the form of either a pressure flushing valve kit or automatically operated flushing cistern, which have been tested to ensure compliance with National Regulations.

2.10 Flush Free Urinals

A urinal - complete with housing, trap and associated components designed to retrofit into existing urinals

2.11 Bath Tubs

A sanitary appliance (including whirlpools, air and jetted variants) for the immersion and washing of the human body or parts of it.

3 TECHNICAL CRITERIA

3.1 General

The Unified Water Label (UWL) lists the maximum volume for registration into the scheme. Therefore, product performance tolerances can be no more than the stated performance. Products submitted for approval shall comply with all relevant National Regulatory requirements of the country of intended destination.

It is a prerequisite of the scheme that products and their internal components shall satisfy the scheme criteria and all test reports verifying compliance shall be retained for inspection if called upon by the scheme administrator prior or during any audit process.

Measurement equipment must be calibrated to (inter) National Standards e.g. ISO 9001 or similar. Products Covered within this section; WC Suites, Independent WC bowls, Independent WC, Flushing Cisterns, Replacement WC Flush Mechanisms

It follows that testing under the Scheme is limited to verifying only, that the flush volumes claimed by the applicant comply with the requirements of the scheme.

Note that manufacturers should retain details for principal components and critical dimensions necessary for compliance to the appropriate standard e.g. installation dimensions etc.

4 WATER CLOSETS (WCs) INDEPENDENT BOWLS AND FLUSHING CISTERNS

General

Water Closet or WC is a term that is generally applied to facilities intended for the removal of human waste. It is a colloquial term that is often used as blanket terminology for any part or component of the toilet suite. There are subdivisions of products; WC bowls, flushing cisterns and tested combinations of bowls and cisterns known as suites.

Products Covered with in this section:

- WC Suites
- Independent WC bowls
- Independent WC Flushing Cisterns
- Replacement WC Flushing Mechanisms

3.2 Apparatus

The apparatus described in clause 5 for Type 1 products and for Type 2 clause 6 of EN 997 and EN 14055 shall be used.

4.2 Procedure

The procedures described in clause 5 for Type 1 and clause 6 for Type 2 of EN 997 and EN 14055, as applicable, shall be followed, with the exceptions that the total number of full flushes for single flush products shall be 4 flushes and that the water trap seal depth need not be measured.

The volume of water collected in the measuring vessel after each flushing operation shall be recorded.

4.3 Requirements

The measured volume shall meet the requirements of EN 997 and EN 14055 whichever is applicable.

4.4 Verification of Testing

The product, when verified (flush volume tested in accordance with the details in EN 997 or EN 14055 for the relevant (Sub-)type) shall comply with the supplied Unified Water Label Declaration of Conformity from the Manufacturer, that accompanied the original product applications to the Unified Water Label Scheme.

Applicants shall hold on file copies of test reports verifying compliance such test reports shall detail the principal components that form the suite and critical dimensions necessary for compliance. During the audit process it may be necessary to provide copies of these test reports. Details should also be held that validate the suitability of the WC bowls to be used with a known WC cistern flush volume where applicable.

4.5 Limitation on Testing

It follows that testing under the Scheme is limited to verifying only that the flush volume claimed by the manufacturer.

4.6 Scheme Rating Value

The manufacturer/listing company shall provide to the scheme, on application, the flush volumes to be used within the scheme listing. It is also a requirement that manufacturers/listing company will be required to note this information in their product manual.

4.6.1 Scheme Rating for WCs and Independent Bowls

The calculated average of the 4 flushes in case of single flush or for dual flush based on the average of 1 full flush and 3 reduced flushes shall be rated as per the table below and recorded in Unified Water Label.

Rating	Average flush volume (litres)
Band 1	3.50 or less
Band 2	4.50 or less
Band 3	5.50 or less
Band 4	6.00 or less
Band 5	Greater than 6.00

Figure 1: UWL rating for WCs and Independent Bowls

Manufacturers often validate their Independent bowls to be used with a number of differing flush volumes. and also to indicate that should a larger flush volume cistern be used then the average flush volume will also increase over that detailed on the product and held by the Scheme.

The calculated average of the 4 flushes in case of single flush or for dual flush based on the average of 1 full- flush and 3 reduced flushes shall be rated.

4.6.2 Scheme Rating Value for Independent Flushing Cisterns

Manufacturers often validate the WC flushing cisterns to be used with a number of differing flush volumes. The manufacturer/listing company shall provide to the scheme, on application, the generic WC cistern flush volumes that any given independent WC bowls can be used with.

The calculated average of the 4 flushes in case of single flush or for dual flush based on the average of 1 full - flush and 3 reduced flushes shall be rated as per the table below and recorded in the database of Unified Water Label.

Rating	Average flush volume (litres)
Band 1	3.50 or less
Band 2	4.50 or less
Band 3	5.50 or less
Band 4	6.00 or less
Band 5	Greater than 6.00

Figure 3: UWL rating for Independent Flushing Cisterns

4.7 Principles for Compliance

4.7.1 Water Closets (WCs)

A WC suite of Type 1 is designed to work with specified nominal volume(s) of either 4, 5, 6, 7 or 9 litres of water. WCs complying with the requirements of Type 1 or Type 2 of EN 997, when flushed with the volume(s) claimed by the manufacturer – shall be verified - based either upon:

- an average of 4 flushes for single flush WCs or
- an average of 3 short flushes to 1 full flush for dual flush WCs and interruptible WCs.

4.7.2 Independent WC Bowls

Independent WC bowls complying with the requirements of Type 1 (clause 5) of EN 997, shall be designed for use with and tested using a nominal flush volume of either 4, 5, 6, 7 or 9 litres and when flushed with the volume claimed by the manufacturer – shall be verified based upon either

- an average of 4 flushes for single flush WCs or
- an average of 3 short flushes to 1 full flush for dual flush WCs and interruptible WCs.

Independent WC bowls complying with the requirements of Type 2 (clause 6) of EN 997, that deliver flush volumes which enable Type 2 WC suites (a ratified combination of Independent WC flush cistern and matched WC bowls tested and verified as a suite), when flushed with the volume claimed by the manufacturer – shall be verified based upon either

- an average of 4 flushes for single flush WCs or
- an average of 3 short flushes to 1 full flush.

4.7.3 Independent WC Flushing Cisterns

Independent WC flushing cisterns complying with the requirements of Type 1 (clause 5) of EN 14055, shall be designed for use with and tested using a nominal flush volume of either 4, 5, 6, 7 or 9 litres and when flushed with the volume claimed by the manufacturer – shall be verified either:

- by an average of 4 flushes for single flush WC flushing cisterns or
- by an average of 3 short flushes to 1 full flush for dual flush WC flushing cisterns and interruptible WC flushing cisterns.

Independent WC flushing cisterns complying with the requirements of Type 2 (clause 6) of EN 14055, that deliver flush volumes which enable Type 2 WC suites (a ratified combination of Independent WC flush cistern and matched WC bowl tested and verified as a suite), when flushed with the volume claimed by the manufacturer – shall be verified either:

- by an average of 4 flushes for single flush WC flushing cisterns or
- by an average of 3 short flushes to 1 full flush.

4.7.4 Limitation on Testing

The product, when verified (flush volume tested in accordance with the details in EN 14055 for the relevant Type) shall comply with the supplied Unified Water Label Declaration of Conformity supplied by the Manufacturer that accompanied the original product applications to the Unified Water Label Scheme.

Applicants shall hold on file copies of test reports verifying compliance with the relevant aspects of EN 14055 and Unified Water Label flush volume verification test. Such test reports shall detail the principal components that form the cistern and critical dimensions necessary for compliance to the appropriate standard EN 14055 e.g. critical installation dimensions for performance. During the audit process it may be necessary to provide copies of these test reports as reference. Details should also be held that validate the suitability of the WC flushing cisterns to be used with a known WC bowl flush volume

4.8 Replacement WC Flush Mechanisms

4.8.1 General

Replacement WC flushing devices are fitted to existing cisterns or WC suites as replacement items when repairs or maintenance may be required. Often, they are also replaced as part of water efficiency measures. However, the flush volume function is largely a factor of cistern size and must be matched for performance to the performance of the pan and as such replacement flush mechanisms may not deliver water savings.

Two types of replacement WC flushing devices are considered suitable to meet the requirement and qualification for inclusion on the Unified Water Label:

- Dual Flush Syphons
- Drop type flush valves

To deliver water savings replacement flush mechanisms must therefore be of dual flush design.

4.8.2 Requirement

To ensure durability and effectiveness of the flush the replacement device must comply with the appropriate clauses of EN 997 and EN 14055 and any other legal National Requirements of the country of destination.



4.8.3 Devices designed to replace the existing cistern device

For devices designed to replace the existing cistern device they must meet the following requirements of:

- Specification of the water level(s) and the ability to match the original equipment full flush rate to maintain flush efficacy
- The flush mechanism shall be dual flush in operation with the part flush volume being no greater than $\frac{2}{3}$ the full flush volume for any given installation
- Physical endurance and leakage
- Chemical endurance.
- Suitable instructions explaining how to operate both full and part flush operations shall be provided for the customer/end user.

4.8.4 Use of Efficient Label

Products complying with these requirements will be able to use the 'Unified Water Label' blue icon

4 URINALS

5.1 General

Urinals are sanitary appliances comprising of a bowl for receiving urine and a flushing device e.g. a flushing cistern, delivering water used for flushing and directing both, urine and water into a drainage system

5.1.1 Products Covered with in this section:

- Urinal (bowls)
- Independent Urinal Flushing Cisterns
- Urinal Controllers

5.2 Urinal (bowls) - Principles for compliance

A sanitary appliance which has been tested and complies with Type 1 (clause 6) of EN 13407 or Type 2 (clause 7) of EN 13407.

Urinals complying with the requirements of Type 1 (clause 6) of EN 13407 or Type 2 (clause 7) of EN 13407, shall be designed for use with and tested using a flushing volume and/or flow rate specified by the manufacturer. The flushing volume shall be verified by the average of 4 flushes.

5.2.1 Limitation of Testing

The product, when verified (flush volume tested in accordance with the details in EN 13407 for the relevant Type or Subtype) shall comply with the supplied Unified Water Label Declaration of Conformity supplied by the Manufacturer that accompanied the original product applications to the Unified Water Label Scheme.

Applicants shall hold on file copies of test reports verifying compliance with the relevant aspects of EN 13407 and Unified Water Label flush volume verification test. Such test reports shall detail the principal components that form the suite and critical dimensions necessary for compliance with the EN 13407 e.g. flush rate / flushing device for suitability of the urinal to be used with a flushing devices and critical installation dimensions for performance.

5.2.2 Apparatus

The apparatus described in clauses 6 and 7 and Annex A, B or Annex C of EN 13407 shall be used.

5.2.3 Procedure

The procedures described in clause 6 of EN 13407 for type 1 or in clause 7 of EN 13407 for type 2 as applicable shall be followed with the exception that the water trap seal depth need not be measured. The volume measured after each flushing operation shall be recorded.

5.2.4 Requirements

The measured volume shall meet the requirements of EN 13407.

5.2.5 Scheme Rating Value

The calculated average of the 4 flushes shall be rated as per the table below and recorded in the database of the Unified Water Label.

Rating	Average flush volume (litres)
Band 1	≤ 1,00 L
Band 2	1.01 – 2,00 L
Band 3	2.01 – 3,00 L
Band 4	3.01 - 4,00 L
Band 5	> 4.00 L

Table 4: Rating of Urinals e.g. Urinal Bowls

5.3 Independent Urinal Flushing Cisterns

5.3.1 Principles for compliance

Independent urinal flushing cisterns complying with the requirements of Type 3 (clause 7) of EN14055 when flushed with the volume(s) claimed – shall be verified by the average of 4 flushes.

For claimed volumes the manufacturer shall provide the customer with an instruction manual showing adjustments of the flush rate and the flush volume in accordance with the requirements of a particular urinal in the following ranges measured in accordance with EN 13407 Annex B.

It follows that testing under the scheme is limited to verifying only, that the flush volumes claimed by the applicant comply with the requirements of the scheme.

5.3.2 Limitation on Testing

The product, when verified (flush volume tested in accordance with the details in EN 14055 for Type 3 products) shall comply with the supplied Unified Water Label Declaration of Conformity supplied by the Manufacturer that accompanied the original product applications to the scheme.

Applicants shall hold on file copies of test reports verifying compliance with the relevant aspects of EN 14055 and Unified Water Label flush volume verification test. Such test reports shall detail the principal components that form any critical dimensions necessary for compliance with the EN 14055 e.g. critical installation dimensions for performance. During the scheme annual audit, it may be necessary to provide copies of these test reports.

5.3.3 Apparatus

The apparatus described in clause 5 for Type 3 products of EN 14055 shall be used.

5.3.4 Procedure

The procedures described in clause 5 for Type 3 products of EN 14055 as applicable shall be followed, with the exception that the total number of flushes shall be 4. The volume measured after each flushing operation shall be recorded.

5.3.5 Requirements

The measured volume shall meet the requirements of EN 14055. The measured volume shall not exceed the claimed nominal value of any quoted flush volume.

5.3.6 Scheme Rating Value

The calculated average of the 4 flushes shall be rated as per the table below and recorded in the database of the scheme.

Rating	Average flush volume (litres)
Band 1	≤ 1,00 L
Band 2	1.01 – 2,00 L
Band 3	2.01 – 3,00 L
Band 4	3.01 - 4,00 L
Band 5	> 4.00 L

5.4 Urinal Controllers (Applicable to UK only)

A urinal controller device, in the form of either a pressure flushing valve kit or automatically operated flushing cistern, which have been tested to ensure compliance with National Regulations.

5.4.1 Principles for compliance

All pressure flushing valves shall deliver a maximum flush volume of 1.50 litres per flush per bowl.

All automatically operated flushing cisterns serving urinals shall be filled with water at a rate of 10 litres/hour per urinal bowl for a cistern serving a single urinal bowl or 7.50 litres/hour per urinal bowl or position or as the case might be each 700mm width of urinal slab for a cistern serving 2 or more urinals.

Urinal controllers are available in a number of forms from controllers designed to operate a flush to a single urinal bowl, to a controller that controls the flow of water into a cistern, which flushes multiple urinal bowls, or a stall designed for multiple persons.

Testing under the Scheme is limited to verifying only, that the flow rate(s) and requirement

5.4.2 Procedure

There are two types of permitted urinal controllers:

- A pressure flushing valve kit with no extra parts needed, supplied to meet requirements. Directly connected to a supply or distributing pipe which is designed to flush the urinal either manually or automatically, provided that the flushing arrangement incorporates a DC pipe interrupter backflow prevention arrangement or device appropriate to fluid category 5. Installation should be checked to ensure compliance with requirements. For these products, the maximum flush volume per bowl or position each time the valve is used is 1.50 litres per flush. If manually operated solenoid or equivalent pressure flushing valves are used, the valve must be of the normally closed type or latching (bi-stable).
- An automatically operated flushing cistern serving urinals, which shall be filled with water at a rate of:
 - 10 litres/hour per urinal bowl for a cistern serving a single urinal bowl or
 - 7.50 litres/hour per urinal bowl or position or, as the case might be, for each 700mm width of urinal slab for a cistern serving two or more urinals; or
 - If sensors are used to control the flush, then they shall not be falsely triggered, and they should prevent flushing during long periods of non-use (with the exception of a hygienic flush). Hygiene flush periods should be factory set to occur no more frequently than 12 hours or set to default 'off'.

Any sensor should ensure that the urinal is only flushed after use, excluding hygiene flush.

In each case the controller must be designed so that on installation it can be adjusted to deliver water flush cycles that comply with the Water Supply (Water Fittings) Regulations 1999 i.e. less than 1.50 litres per urinal bowl or position each time the device is operated.

As this is typically an installation requirement then this aspect must be verifiable on physical audit of the product and must be suitably documented in the product documentation to ensure that operatives can install and adjust the product to give suitable performance.

5.4.3 Use of Efficient Label

Products complying with these requirements will be able to use the 'blue icon' Unified Water Label.



6. Flush Free Urinals

6.1 General

A urinal complete with housing, trap and associated components designed to retrofit into existing urinals that have been tested and comply with resistance to blockage and trap backpressure tests in clause numbers section resistance to blockage test etc and back pressure test as listed in 3.8.3 It follows, that testing under the Scheme is limited to verifying only those tests detailed.

The products, when verified in accordance with tests as listed in this section for resistance to blockage and trap backpressure tests shall comply with the supplied Declaration of Conformity from

the manufacturer that accompanied the original product applications to the Unified Water Label Scheme.

6.2 Functional Tests

Verification required for the following tests: -

Resistance to Blockage Test

Trap Test Pressure Test

Installation and Maintenance.

6.3 Resistance to Blockage Test - Procedure

Two unfiltered cigarette pieces shall be deposited into the urinal. The length of the cigarette pieces shall be 1.5in +/- 0.25in (38mm +/- 6.4mm) and created by folding an unfiltered cigarette back upon itself such that the cigarette paper tears or breaks apart in approximately one-half lengths.

Tap water shall be added to the unit at a flow rate of 0.5L per min. Cigarette pieces and water shall be alternately added to the urinal until a total of 20 cigarette pieces and 5L of water have been added. The cigarette pieces shall then be removed from the urinal and the test shall be conducted five additional times (for a total of six test replicates).

Alternate between unfiltered and crumpled unfiltered cigarettes per test so that three tests are conducted using unfiltered cigarettes and three tests are conducted using crumpled unfiltered cigarettes.

6.3.1 Requirement

There shall be no evidence of blockage or clogging during each test run with cigarette pieces in the fixture and when removed.

6.4 Trap Backpressure Test - Procedure

The trap insert shall be installed and removed 6 times using the extractor tool provided by the manufacturer. This shall be considered one repetition. Upon completion of the extractions and insertions, the trap shall be capable of withstanding an air test of positive pressure of 0.04 -0/+0.002 bar for at least 3 mins. Every trap should remain leak tight.

6.4.1 Requirement

There shall be no pressure loss at any time during the test and the reliability between water seal and open drain must be maintained.

6.5 Installation & Maintenance

The manufacturer's instructions for installation and maintenance must be followed to ensure correct fitting of products and their cleaning regime are maintained

7 BATH TUBS

7.1 Procedure

Use any suitable means e.g. weighing/volume measurement, to establish the volume of water contained when the bath tub is filled to a point at which water first flows through the overflow fitment.

Bath tub without provision of an overflow fitment shall be filled to a level 86 mm below their spill over level.

Note: 86 mm is intended to replicate the invert of an overflow fitment should one have been installed at the maximum height permitted by EN 232 i.e. dimension H1 \geq 60 mm.

By calculation, establish and record the volume.

7.2 Requirement

The volume shall be recorded.

7.3 Scheme Rating Value

Product will be further sub-divided into the following bands allowing for the fixing of the Scheme Label to the product. A grey arrow on the efficiency rating chart allows for the optional quotation of actual capacity to enable consumers to identify where in the band a particular product sits. If this is used, then value quoted must be rounded to the nearest whole number.

Using calculations detailed in EN 806-5: 2012 the effective capacity (i.e. the water required, allowing for displacement of a person, to take a satisfactory bath tub) of a bath tub is 40% of the measured volume. While this is not often understood it is a useful messaging tool to aid consumers in the selection of the correct product.

Rating	Actual Capacity (litres)	Effective Capacity (40%) of Actual (litres)
Band 1	\leq 155L	\leq 62L
Band 2	\leq 170L	\leq 68L
Band 3	\leq 185L	\leq 74L
Band 4	\leq 200L	\leq 80L
Band 5	\leq 200L	$>$ 80L

Table 5: Banding for Baths, actual and effective capacity


7.4 Energy Calculation

To calculate the energy aspect of filling the bath tub for each bathing event refer to the energy calculation section 3.5 of the Tap and Shower criteria.

7.5 Energy Icons

The energy icon can be added to the base of the Unified Water Label to depict to the consumer the expected annual energy cost of using the product. It is a requirement of the scheme that bath tubs shall carry the energy icon. The energy icon shall in all cases be placed under the main water rating and to the far left of the space provided for all technical icons (for the applicable categories).

An example of the energy icons can be seen below:

Description		Icon	Applicable to
Energy*	Calculation of energy use		All taps and showers

the energy icon needle will be set according to the kWh/p.a. calculated and then set at an angle determined in the Unified Water Label Using the Label Guidelines that provide Manufacturers with label design and use.

8 TECHNICAL ICONS



8.1 General


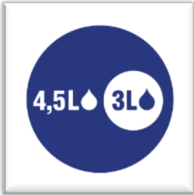



To enhance the label and to highlight to consumers technical features present, manufacturers are able to add a maximum of three technical icons (in addition to the energy icon) to the label.

8.2 Icons



The criteria to support the range of technical icons relates to compliance with the relevant hEN, no further criteria is included.



WC Icons

Description	Icon	Applicable to
Standard Cistern and Bowl Arrangement with a washdown toilet bowl – all trap arrangements.		Gravity Flushing Toilets
Single Flush Standard Cistern and bowl Arrangement with a washdown toilet bowl – all trap arrangements.		Gravity Flushing Toilets

Assisted Flush Standard Cistern and bowl Arrangement with a washdown toilet bowl – all trap arrangements.		Assisted Flushing Toilets
Dual Flush Standard Cistern and bowl Arrangement with a washdown toilet bowl – all trap arrangements. Full and reduced Flush volumes will be stated in the label.		Any Dual Flushing Toilets
Standard Cistern and toilet bowl combination – all trap arrangements.		Cistern and bowl sold together
Standard toilet bowl sold on its own – all trap arrangements.		Back to wall, low level, close coupled wall hung toilets
Standard toilet cistern sold on its own – all trap arrangements.		Cisterns, Low level, including cisterns enclosed in wall frames.

Urinal Icons

Description	Icon	Applicable to
A pressure flushing valve kit with no extra parts needed, supplied to meet requirements. Directly connected to a supply or distributing pipe which is designed to flush the urinal manually		Gravity Flushing Toilets
An electronic automatically operated flushing sensor valve serving urinals		

Urinal Bowl independent or sold with cistern		Urinal Bowls
Urinal Bowl independent or sold with cistern		Urinal Bowls